European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol.10, No.33, 2018

Internal Green Supply Chain Management Practices Influence on Firm Performance

Annika E. Jave Díaz* Cheng Guo Ping
School of Management, Wuhan University of Technology, Wuhan, P.R. China, 430070

Abstract
Green supply chain management (GSCM) is a valuable tool for manufacturing companies that seek to reduce the environmental impact and also improve their firm performance. However, in South America, this topic is just emerging. Based on a survey of 216 respondents, this paper assesses the impact of the implementation of internal green supply chain management practices (internal environmental management and eco-design) on environmental, operational and economic performance of Peruvian manufacturing companies. The data was analyzed through partial least squares structural equation modeling (PLS-SEM). The findings show that internal environmental management positively influences the three aspects of firm performance but eco-design only influence environmental and operational performance. The practical implications of this research suggest that managers should put their efforts on implementing internal GSCM practices to obtain the benefits on performance.
Keywords: Green Supply Chain Management (GSCM), Internal Environmental Management (IEM), Eco-Design (ED), firm performance, Peru

1. Introduction

Nowadays companies have to face changing environments where technology becomes obsolete more quickly, consumers demand more differentiated products and services, in addition, with increasing competition, they have to be more aware of changes in products and service´s design. Companies will obtain better results by working with their partners as a network rather than competing by themselves (Min & Zhou, 2002). In this context, that competition is happening more between supply chains, Green Supply Chain Management (GSCM) is a beneficial strategy for companies that want to improve performance while satisfying different requirements from stakeholders demanding more respect for the environment (Geng, Mansouri, & Aktas, 2017). Srivastava (2007) has stated that GSCM can help companies to lower the negative impact of manufacturing activities on the environment while at the same time preserving the quality, functionality, and cost of products and services. It is expected that the importance of GSCM will increase with the globalization and that companies will need to modify their strategies to diminish the harmful effect of their processes on the planet (Lewis & Gertsakis, 2001). Qinghua Zhu, Sarkis, and Lai (2013) classified GSCM practices into internal and external. A considering number of previous investigations have highlighted the importance to establish first internal green practices, like Internal Environmental Management (IEM) and Eco-design (ED), because this is the base for the successful implementation of the other green practices (Lane, Koka, & Pathak, 2006; Takeishi, 2001) . The empirical evidence shows that manufacturing companies from developing countries like China tend to implement first internal practices because they only need to handle and develop their internal capabilities and resources (Qinghua Zhu et al., 2013). For instance, with IEM, top-level managers integrate environmental objectives in the mission of the company to set goals that will be communicated to the different departments (Green Jr, Zelbst, Meacham, & Bhadauria, 2012). In ED stage, companies will anticipate the use of their resources to avoid the excessive consumption of energy, water and hazardous materials. It is important to identify the outcome of the implementation of GSCM internal practices on firm performance - environmental, operational and economic. Observational results could motivate managers to start the implementation of GSCM practices. As mention by Green Jr et al. (2012) GSCM practices designed precisely to reduce the negative ecological footprint of manufacturing firms. The majority of empirical studies have shown progress on environmental performance in the reduction of waste, pollution, and emissions. Several studies have also confirmed that the implementation of GSCM practices has a positive influence on operational performance as an increase in efficiency processes (Lee, Tae Kim, & Choi, 2012; M. Lee, Sung Rha, Choi, & Noh, 2013). However, the results of economic performance have been inconclusive. For instance, (Qinghua Zhu and Sarkis (2004); Qinghua Zhu, Sarkis, and Geng (2005)) hold that there is no clear association between economic performance and GSCM practices in Chinese manufacturing companies. Those results can be explained because in those years the adoption of GSCM practices was in its early stages. Usually, the level of investment at the beginning of the implementation is high and this costs increase may produce a negative impact on economic performance (Geng et al., 2017). However, studies in recent years have shown a positive relationship between GSCM practices and economic performance e.g. (Kuei, Chow, Madu, and Wu (2013); Lai and Wong (2012)). The aim of this study is to analyze empirically the effects of the implementation of IEM and ED on firm performance of manufacturing companies in Peru.

2. Theoretical background and Hypotheses

2.1 Internal Environmental Management

Internal environmental management (IEM) is a set of internal green activities that seek to reduce the harmful effects on the environment. These practices include the commitment of senior and mid-level managers, inter-departmental cooperation for sustainable objectives, programs of pollution prevention and ISO 14000 certification (Cheng, Chen, & Huang, 2014; Kuei et al., 2013). Top-level management commitment is the first step to comply with regulations, it is necessary to establish environmental sustainability goals and strategies that will be communicated to different departments. Sustainable practices are the responsibility of all areas, therefore the inter-departmental coordination and communication are fundamental for the successful implementation of environmental objectives. The implementation of ISO 14000 is a voluntary action of the companies that want to improve their environmental management by enhancing production skills while protecting the environment and decreasing the pollution. Even though in developing countries like Peru most manufacturing companies do not have ISO 14000, companies manifest their interest to implement it because it is an opportunity for them to access environmental conscious markets. In accordance with Qinghua Zhu and Sarkis (2004), it can be said that IEM eliminate barriers for the implementation of ecological actions and also empower cross-functional cooperation that will benefit performance.

2.2 Eco-design

Frequently the environmental impacts generated during production, consumption, and disposal of the products are a direct consequence of the decisions taken in the initial stage of design (Handfield, Walton, Sroufe, & Melnyk, 2002). Eco-design is an environmental practice that can help companies to gain competitive advantage. It consist of adding ecological characteristics to production processes in different stages of product's life cycle without generating a trade-off with other value-add characteristics for customers such as cost and utility (Aoe, 2007; Green Jr et al., 2012). The first step of ED requires a life cycle assessment that will determine the environmental impact of the product over its life (Zutshi & Sohal, 2004). Then the raw materials will be selected considering using recyclable and reusable materials and decreasing the use of hazardous materials and packaging (Zsidisin & Siferd, 2001), this step will facilitate the reuse of the product or its parts (Sarkis, 1998). These choices of materials will lead to select the consumption of energy and water trying to avoid waste. As a result, ED can help to determine in advance the utility, durability, energy consumption of the product during its entire life cycle (Hanim Mohamad Zailani, Eltayeb, Hsu, & Choon Tan, 2012).

2.3 Environmental Performance

The environmental performance associated with the manufacturing sector aims to achieve reduction of pollution, air emissions, solid and water waste, energy consumption and hazardous materials (Chiou, Chan, Lettice, & Chung, 2011; Qinghua Zhu et al., 2005). The literature poses that GSCM practices were designed precisely to reduce the negative ecological footprint of manufacturing firms (Green Jr et al., 2012; Qinghua Zhu & Geng, 2013; Qinghua Zhu et al., 2013). For instance, in internal environmental management the environmental performances is a direct concern of top-level managers because they have to comply with regulations and stakeholders interests integrating ecological concerns on all the stages of production (Azevedo, Carvalho, & Cruz Machado, 2011). Eco-design is another green practice that is considered as the practice with the highest impact on environmental performance because most of the product characteristics are decided in this stage (Geng et al., 2017). Companies should consider the use of ED to minimize the negative environmental impact while maintaining the functionality of the products at the same time (Qinghua Zhu & Sarkis, 2004). Eco-design can drive firms to positive environmental performances if there is a decrease of emissions, energy and water consumption and enhance treatment of scraps (Lin & Wu, 2014). A study in a developing country by (Saeed, Jun, Nubuor, Priyankara, & Jayasuriya, 2018) reported a significantly positive effect of both IEM and eco design practices on the environmental performance. Hence, this paper supports a possible positive relationship of IEM and ED with environmental performance and presents the following hypotheses:

H1a: Internal environmental management positively and directly influences environmental performance.

H1b: Eco-design positively and directly influences environmental performance.

2.4 Economic Performance

Economic performance in companies that have implemented sustainable practices can be identified as the decrease of the cost for waste treatment and discharge, material purchasing and energy consumption as well as a decrease of penalties for environmental accidents. All of these indicators are very attractive for managers. Economic benefits, especially in developing countries, are the principal motivator to take the initiative to implement GSCM practices (Lee et al., 2012). Previous studies have demonstrated that internal environmental management has a positive influence on economic performance (Geng et al., 2017; Kuei et al., 2013). The honest concern of the companies for the environmental conservation will make them shift to green strategies to protect

the ecosystem, as a consequence, they will avoid penalties and unnecessary costs. In eco-design stage companies will try to minimize waste, energy and water consumption, these actions may lead to reduce costs and consequently improve economic performance. This statement is in accordance with Rao and Holt (2005), who found that greening the supply chain will drive to cost savings. However, other authors like Green Jr et al. (2012) argue that ED trying to lower the environmental impact will incur in additional cost perhaps of materials. The literature has investigated the influence of GSCM practices implementation on economic performance but the results are not determinant. To investigate further the effect of the implementation of IEM and ED on economic performance of manufacturing companies' from Peru, the following hypotheses are presented:
H2a: Internal environmental management positively and directly influences economic performance.
H2b: Eco-design positively and directly influences economic performance.

2.5 Operational Performance
Operational performance can be perceived as the capacity of a company to be more efficient and to satisfy customers. There are different indicators to assess operational performance that include reduction of inventory levels, scrap rates, delivery times, enhancement of product's quality, product line and capacity utilization (Qinghua Zhu, Sarkis, & Lai, 2012). The adoption of GSCM can lead to obtain favorable results in these indicators. Several empirical studies have confirmed that the implementation of environmentally sustainable practices has a positive influence on operational performance (Lee et al., 2012; M. Lee et al., 2013). For instance, internal environmental management has a positive and direct influence on operational performance as an improvement of quality and delivery time (Geng et al., 2017; Lai & Wong, 2012; Yang, Lu, Haider, & Marlow, 2013). This internal green practice is a useful tool that will improve collaboration with supply chain partners for production capacity that in turn will help to improve flexibility and efficiency (Vachon & Klassen, 2008). Eco-design also influences positively operational performance (Geng et al., 2017). Implementing sustainable characteristics in design stage throughout the product's life cycle will lead companies to achieve environmental performance. Thus, this study poses the following hypotheses:
H3a: Internal environmental management positively and directly influences operational performance.
H3b: Eco-design positively and directly influences operational performance.

3.Research design
For the present study, the data were collected using survey questionnaires. Companies considered were from the manufacturing sector that includes different industries such as footwear, leather, textile, plastics, electronics and metal. These industries were chosen for being regarded as direct polluters of the environment. For the purpose of the investigation, the respondents were middle-level managers, plant managers, and operation managers. The survey questionnaire investigates the relationship between internal environmental management and eco-design with environmental, economic and operational performance. It was divided into 2 sections, the first section examines the level of implementation of internal practices - IEM & ED with five and four items respectively; the items were adopted from Qinghua Zhu et al. (2013) and Qinghua Zhu, Sarkis, and Lai (2008). A five-point Likert scale was used (1=not considering it; 5=implementing successfully). The second section explores in which degree the adoption of green practices improve the environmental, economic and operational performance of the firms. This section has six, five and six items respectively that were adopted from Qinghua Zhu et al. (2013), also using a five-point Likert scale (1=not at all; 5=significant). In total 241 filled questionnaires were obtained and were checked to ensure completeness and normality of the data, 25 were discarded due to incompleteness and inconsistencies of responses. The data was analyzed using partial least square structural equation modeling using the SmartPLS3.2.7 software (Ringle, Wende, & Becker, 2015).

4. Model Assessment Through PLS
Overall analysis is done in two stages in PLS-SEM, where reliability and validity of constructs is authenticated at measurement model level while hypotheses are examined in the second stage at structural model level (Hair, Ringle, & Sarstedt, 2011). Internal consistency of the defined constructs is finalized by having value of CR higher than 0.7. Table 1 show that all the CR values are above the required value and in the range of 0.809 to 0.883. Convergent validity is assumed present if the average variance extracted (AVE) of the construct is 0.5 or above. AVE values are also as per the requirements and between the ranges of 0.510 to 0.583 as visible in table 1. All indicators should have item loading of 0.7 or higher, although values above 0.5 are also acceptable provided AVE value of the construct is higher than 0.5. Items IEM1 and ECP1 were dropped because of low loadings (less than 0.5).

Table 1. Statistical Quality Indicators

	ED	ECP	ENP	IEM	OPP
AVE	0.573	0.516	0.510	0.583	0.560
CR	0.842	0.809	0.861	0.848	0.883
R^2		0.157	0.297		0.225

Discriminant validity can be confirmed by making it sure that each construct is sufficiently unique and different from other constructs in the model (Fornell & Larcker, 1981). In PLS literature heterotrait-monotrait (HTMT) ratio is considered a better approach to confirm the presence of discriminant validity as compare to more traditional Fornall-Larcker method (Henseler, Ringle, & Sarstedt, 2015). The threshold values of 0.85 and 0.90 of HTMT are suggested to establish discriminant validity. This study has used the more conservative value of 0.85 and table 2 depicts that all values are below this value and mark the presence of discriminant validity.

Table 2. Discriminant Validity- HTMT Ratio

	ED	ECP	ENP	IEM	OPP
ED					
ECP	0.301				
ENP	0.481	0.726			
IEM	0.578	0.421	0.614		
OPP	0.477	0.661	0.647	0.466	

Structural Model Assessment

After verifying the measurement model, next step is to test the hypotheses by bootstrapping method and confirm the proposed model. We achieved this by the assessment of beta coefficients, their direction and also with R square values. Figure 1 shows the beta coefficients along with their t-values (in parentheses) and t-values of item loadings are also visible to prove their significance. A bootstrapping procedure in SmartPLS3 was run with 5000 iterations and significance level of 0.5 for one tail test was selected. Figure1 shows the results where hypothesis 2b is rejected because it was not significant. All other hypotheses were accepted showing the positive impact of internal green supply chain management practices on environmental, economic and operational performance of the manufacturing organizations in Peru. Figure 1 depicts the Beta value of internal environmental management to environmental performance is 0.382 (t-value 5.143; p <0.000); IEM to ECP is 0.327 (t-value 4.263; p<0.000); IEM to OPP is 0.277 (t-value 4.136; p<0.000); ED to ENP is 0.249 (t-value 2.732; p<0.000); ED to OPP is 0.277 (t-value 2.979; p<0.000); ED to ECP is 0.120 (t-value 0.905; p<0.183) which is a not significant value therefore in the context of this study, it appears that eco-design does not influence positively economic performance.

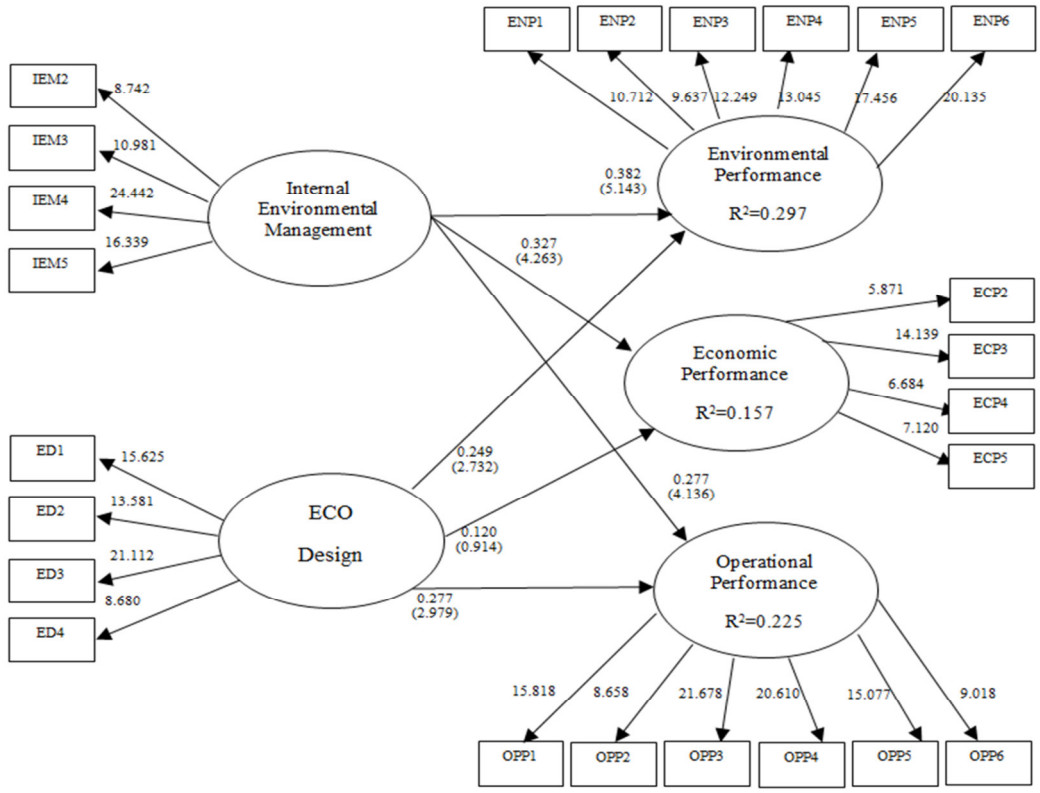

Figure 1: Structural Model

5. Discussion

The results indicate that IEM has a positive relationship with ENP. Similar findings were obtained in previous studies (De Giovanni, 2012; Saeed et al., 2018; Qinghua Zhu et al., 2013). IEM also shows a strong relationship with meeting operational performance goals (Hanna & Rocky Newman, 1995; Qinghua Zhu et al., 2013). A positive relationship was also confirmed between IEM and ECP, which coincided with other authors findings (De Giovanni, 2012; Q. Zhu, Sarkis, & Lai, 2007). Regarding the effect of the implementation of ED on performance, a positive relationship with ENP was found, previous studies also had the same results (Hanim Mohamad Zailani et al., 2012; Saeed et al., 2018). This positive influence of ED on ENP can be explained because in the design stage of products and processes, the durability, packaging, transport, disassembly and other functions of the products can be adapted so that they do not harm the environment. ED is also positively related to OPP, which implies that the company becomes more efficient, managing to reduce waste generation, the level of inventories, increase the quality of products, among other characteristics. Finally, the relationship between ED and ECP was not significant. Previously (Qinghua Zhu & Sarkis, 2007; Qinghua Zhu et al. (2013)) demonstrated a negative relationship between ED and ECP. The insignificant relationship can be explained because manufacturers in Peru may be just starting to implement green practices and ED needs capital investment to acquire new technologies and improve production processes, which will weaken the economic performance. However, companies that are really committed to generate positive change in the green environment will obtain positive results in economic performance in the medium or long term as a result of cost reduction for waste treatment and discharge, material purchasing, energy consumption and environmental accidents (Qinghua Zhu et al., 2013). Some authors suggest that managers should focus their efforts on implementing IEM first and then ED (De Giovanni, 2012; Saeed et al., 2018). ED is an effective practice that initially only requires the company´s internal resources such as commitment of the top and middle level managers and the cross functional cooperation, which will help to obtain better results once ED is implemented.

6. Conclusion

This study empirically tested the effect of the implementation of internal green supply chain management practices on environmental, economic and operational performances of manufacturing firms in Peru. The PLS-SEM analysis of 216 valid questionnaires proved five hypotheses significant between internal GSCM practices and firm performance. The results indicate that internal environmental management leads to better performance in the three different aspects that have been evaluated in this paper. The relationship between eco-design and performance was only significant for environmental and operational performance. These outcomes demonstrate that internal GSCM practices are the first and more important steps when companies want to address environmental concerns in developing countries (Zhu et al., 2005). When companies become environmentally friendly they not only have better ecological performance through reducing levels of pollution, emissions, waste, and energy consumption but also enhancing the firm's operations such as inventory levels, capacity utilization, and additionally also improving economic performance (Geng et al., 2017). This paper has important implications in theory and practice. The outcome of this investigation can be a guide and motivation for the research community of green supply chain management in South America where this topic is becoming more relevant. The practical significance of this study demonstrates that the positive relationship between IEM & ED with firm performance has the potential to promote the adoption of GSCM as a competitive advantage to improve performance. Considering that the results of this investigation are still exploratory in Peru there are opportunities for future research. For example, it would be useful to use a wider sample of manufacturing companies to obtain a better overview of the implementation of GSCM practices and its effects on performance. Studies can also include intervening variables that may lead to finding different results. In addition, future research should try to analyze the influence of ED on performance in specific industrial sectors that face similar situations.

7. References

Aoe, T. (2007). Eco-efficiency and ecodesign in electrical and electronic products. Journal of Cleaner Production, 15(15), 1406-1414.

Azevedo, S. G., Carvalho, H., & Cruz Machado, V. (2011). The influence of green practices on supply chain performance: A case study approach. Transportation Research Part E: Logistics and Transportation Review, 47(6), 850-871. doi: 10.1016/j.tre.2011.05.017

Cheng, J.-H., Chen, M.-C., & Huang, C.-M. (2014). Assessing inter-organizational innovation performance through relational governance and dynamic capabilities in supply chains. Supply Chain Management: An International Journal, 19(2), 173-186.

Chiou, T.-Y., Chan, H. K., Lettice, F., & Chung, S. H. (2011). The influence of greening the suppliers and green innovation on environmental performance and competitive advantage in Taiwan. Transportation Research Part E: Logistics and Transportation Review, 47(6), 822-836.

De Giovanni, P. (2012). Do internal and external environmental management contribute to the triple bottom line? International Journal of Operations & Production Management, 32(3), 265-290.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of marketing research, 39-50.

Geng, R., Mansouri, S. A., & Aktas, E. (2017). The relationship between green supply chain management and performance: A meta-analysis of empirical evidences in Asian emerging economies. International Journal of Production Economics, 183, 245-258. doi: 10.1016/j.ijpe.2016.10.008

Green Jr, K. W., Zelbst, P. J., Meacham, J., & Bhadauria, V. S. (2012). Green supply chain management practices: impact on performance. Supply Chain Management: An International Journal, 17(3), 290-305.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. Journal of Marketing theory and Practice, 19(2), 139-152.

Handfield, R., Walton, S. V., Sroufe, R., & Melnyk, S. A. (2002). Applying environmental criteria to supplier assessment: A study in the application of the Analytical Hierarchy Process. European journal of operational research, 141(1), 70-87.

Hanim Mohamad Zailani, S., Eltayeb, T. K., Hsu, C.-C., & Choon Tan, K. (2012). The impact of external institutional drivers and internal strategy on environmental performance. International journal of operations & production management, 32(6), 721-745.

Hanna, M. D., & Rocky Newman, W. (1995). Operations and environment: an expanded focus for TQM. International Journal of Quality & Reliability Management, 12(5), 38-53.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the academy of marketing science, 43(1), 115-135.

Kuei, C.-h., Chow, W. S., Madu, C. N., & Wu, J. P. (2013). Identifying critical enablers to high performance environmental management: an empirical study of Chinese firms. Journal of environmental planning and management, 56(8), 1152-1179.

Lai, K.-h., & Wong, C. W. Y. (2012). Green logistics management and performance: Some empirical evidence from Chinese manufacturing exporters. Omega, 40(3), 267-282. doi: 10.1016/j.omega.2011.07.002

Lane, P. J., Koka, B. R., & Pathak, S. (2006). The reification of absorptive capacity: A critical review and rejuvenation of the construct. Academy of management review, 31(4), 833-863.

Lee, S. M., Tae Kim, S., & Choi, D. (2012). Green supply chain management and organizational performance. Industrial Management & Data Systems, 112(8), 1148-1180.

Lewis, H., & Gertsakis, J. (2001). Design+ environment: a guide to designing greener goods. 2001. Sheffield: Greenleaf publishing.

Lin, Y., & Wu, L.-Y. (2014). Exploring the role of dynamic capabilities in firm performance under the resource-based view framework. Journal of business research, 67(3), 407-413.

M. Lee, S., Sung Rha, J., Choi, D., & Noh, Y. (2013). Pressures affecting green supply chain performance. Management decision, 51(8), 1753-1768.

Min, H., & Zhou, G. (2002). Supply chain modeling: past, present and future. Computers & Industrial Engineering, 43(1-2), 231-249.

Rao, P., & Holt, D. (2005). Do green supply chains lead to competitiveness and economic performance? International journal of operations & production management, 25(9), 898-916.

Ringle, C., Wende, S., & Becker, J.-M. S. (2015). SmartPLS 3.2.7; SmartPLS GmbH: Boenningstedt: Germany.

Saeed, A., Jun, Y., Nubuor, S. A., Priyankara, H. P. R., & Jayasuriya, M. P. F. (2018). Institutional Pressures, Green Supply Chain Management Practices on Environmental and Economic Performance: A Two Theory View. Sustainability, 10(5), 1517.

Sarkis, J. (1998). Evaluating environmentally conscious business practices. European journal of operational research, 107(1), 159-174.

Srivastava, S. K. (2007). Green supply□chain management: a state□of□the□art literature review. International journal of management reviews, 9(1), 53-80.

Takeishi, A. (2001). Bridging inter□and intra□firm boundaries: management of supplier involvement in automobile product development. Strategic management journal, 22(5), 403-433.

Vachon, S., & Klassen, R. D. (2008). Environmental management and manufacturing performance: The role of collaboration in the supply chain. International Journal of Production Economics, 111(2), 299-315.

Yang, C.-S., Lu, C.-S., Haider, J. J., & Marlow, P. B. (2013). The effect of green supply chain management on green performance and firm competitiveness in the context of container shipping in Taiwan. Transportation Research Part E: Logistics and Transportation Review, 55, 55-73. doi: 10.1016/j.tre.2013.03.005

Zhu, Q., & Geng, Y. (2013). Drivers and barriers of extended supply chain practices for energy saving and emission reduction among Chinese manufacturers. Journal of Cleaner Production, 40, 6-12.

Zhu, Q., & Sarkis, J. (2004). Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. Journal of Operations

Management, 22(3), 265-289. doi: 10.1016/j.jom.2004.01.005

Zhu, Q., & Sarkis, J. (2007). The moderating effects of institutional pressures on emergent green supply chain practices and performance. International Journal of Production Research, 45(18-19), 4333-4355.

Zhu, Q., Sarkis, J., & Geng, Y. (2005). Green supply chain management in China: pressures, practices and performance. International journal of operations & production management, 25(5), 449-468.

Zhu, Q., Sarkis, J., & Lai, K.-h. (2008). Confirmation of a measurement model for green supply chain management practices implementation. International Journal of Production Economics, 111(2), 261-273. doi: 10.1016/j.ijpe.2006.11.029

Zhu, Q., Sarkis, J., & Lai, K.-h. (2012). Examining the effects of green supply chain management practices and their mediations on performance improvements. International Journal of Production Research, 50(5), 1377-1394. doi: 10.1080/00207543.2011.571937

Zhu, Q., Sarkis, J., & Lai, K.-h. (2013). Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices. Journal of Purchasing and Supply Management, 19(2), 106-117. doi: 10.1016/j.pursup.2012.12.001

Zhu, Q., Sarkis, J., & Lai, K. H. (2007). Initiatives and outcomes of green supply chain management implementation by Chinese manufacturers. J Environ Manage, 85(1), 179-189. doi: 10.1016/j.jenvman.2006.09.003

Zsidisin, G. A., & Siferd, S. P. (2001). Environmental purchasing: a framework for theory development. European Journal of Purchasing & Supply Management, 7(1), 61-73.

Zutshi, A., & Sohal, A. S. (2004). Adoption and maintenance of environmental management systems: critical success factors. Management of Environmental Quality: An International Journal, 15(4), 399-419.